

Montgomery County Technology Architecture



Department of Technology Services

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Background

Montgomery County is poised to take advantage of mature technologies in areas of *data, voice and radio networking, datacenter operations and monitoring, hardware and systems software deployment and application development*. This document, prepared by Department of Technology Services (DTS), may be utilized as a comprehensive reference to the County's architecture in moving forward with upcoming programs. DTS believes in developing the County architecture based on its business needs such as improving operational efficiencies and enhance productivity.

Executive Summary

The document addresses Montgomery County's technical architecture in the areas of Information Technology (IT), Telephone and Radio systems. The purpose and motivation for the document is to concisely present well-defined strategic standards adopted in the County for the development and delivery of information systems. It provides a cohesive blueprint in order to optimally design, purchase, develop, deploy and manage information systems in the County. The components of the overall infrastructure are captured in Figure 1 – Information Technology Framework.

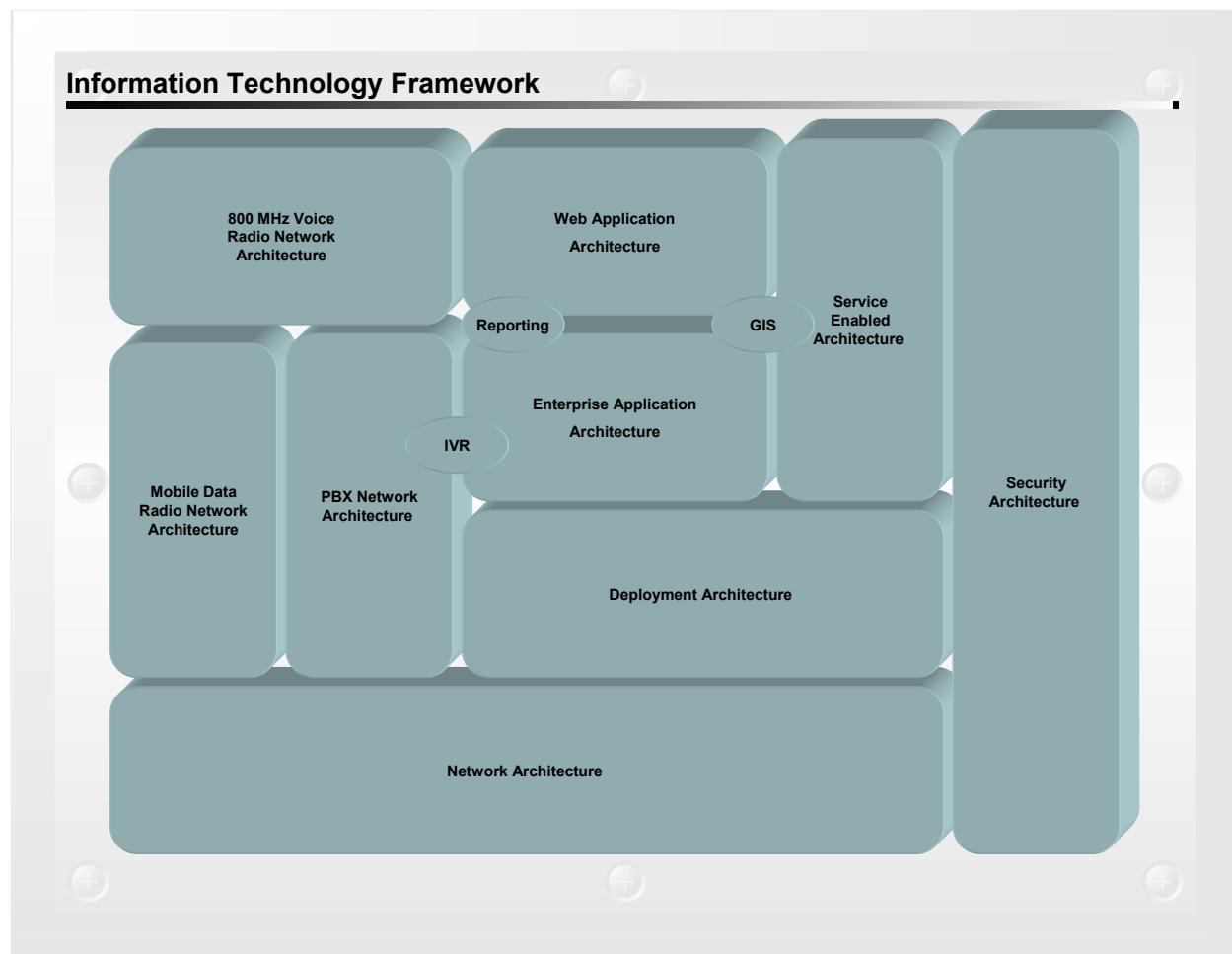


Figure 1

The integrated approach to developing complimentary technologies is expected to yield rapid return of investments for new and upcoming programs. The County will also benefit from consolidating technology in certain spaces by increasing depth of knowledge and skill-set while lowering the total cost of ownership.

Montgomery County Technology Architecture

The Architecture is being formulated in order to achieve efficiencies based on economies of scale. The standardization of technologies will encourage the development and purchase of reusable infrastructure and business components. This will enhance in-house employee skill-sets in a predictable set of hardware, systems software, Commercial Off-The-Shelf (COTS) packages, and communication and networking platforms. The tiered architecture will permit horizontal scaling of solutions by rapid allocation of skills and resources.

As Figure 1 suggests, Montgomery County Technical Architecture may be defined as a collection of the following components architectures:

- Enterprise Application Architecture – addressing business process automation
- Web Application Architecture – enabling rapid application development
- Service Enabled Architecture – avoiding stovepipe applications
- Deployment Architecture – optimally utilizing resources and sharing costs
- Network Architecture – leveraging common infrastructure
- Security Architecture – implementing secure access control management
- Geographical Information System Architecture – leveraging local geo-data
- Reporting Architecture – leveraging standard reporting engines
- Interactive Voice Response Architecture – providing integrated approach to IT and Telephony
- Mobile Data Radio Network Architecture – enabling mobile voice and data services
- PBX Network Architecture – providing quality landline services
- 800MHz Voice Radio Network Architecture – enabling 800MHz voice communication

The Department of Technology Services (DTS), under the leadership of the Chief Information Officer (CIO) and Chief Technology Officer (CTO), identified an Enterprise Architecture (EA) framework to build business solutions. With increasing focus on Customer Service and inter-agency development, the County initiated formal processes to identify, develop and maintain certain core competencies in Information Technology (IT). The goal was to improve the County's ability to efficiently respond to new challenges with the optimal use of technology and resources. It also had the positive impact of streamlining County resources and skill sets. The Enterprise Architecture addresses the following areas:

- Requirements Management
- Software Development
- Application Deployment
- Network Management
- Security Infrastructure
- Telecommunications and Radio Infrastructure
- Project and Vendor Management

With a goal of maximizing productivity and enhancing government services, DTS has embraced industry best-practices to gather and document customer requirements effectively and identify business process improvements. Requirements Management is an integral portion of DTS' Project Management Methodology, which mandates the need for robust documentation, analysis and review of end-user requirements.

EA addresses the need for developing software applications to meet the requirements of the user community. It is a general expectation that solutions developed in the County will be web-based using browsers as thin-clients. Based on usage patterns, scalability and availability requirements, software applications will be developed using 3-tiered Model-View-Controller (MVC) patterns using either Java J2EE or Microsoft's .NET technologies. The County has developed a sophisticated system of delivering cartographic presentations to perform data analysis / decision support services. The County also has identified two reporting packages with distinct capabilities to meet its diverse requirements.

The Deployment standards are designed to leverage open standards, interoperability and economies of scale. Standardization and control of the various components of architecture are key to achieving a high level of manageability and controlling system management resources. The County has standardized on one desktop platform and one server platform with the goal to provide 24x7 enterprise server system administration, application deployment and mechanized support infrastructure.

The County's Network Team deploy, monitor and support its reliable and robust transport layer that services voice, video, data and emergency radio applications. Montgomery County is unique among its peers because the County is its own telecommunications carrier. Telephony, public safety radio, data and video application services ride over a County owned and operated electro-optical wide area, campus area and local area network infrastructure supplemented with leased frame-relay services from the local exchange carrier.

The Network Security Team uses a wide variety of commercial and open source tools to protect assets from damages resulting from viruses/worms/Trojans and other attacks. The goal of the Security Team is to seamlessly integrate industry standard security practices and design in order to maintain integrity and security in all County technologies, including the implementing of secure access control management.

The County's Telecommunications and Radio Infrastructure consists of multiple components. The Interactive Voice Response (IVR) enables callers to retrieve information or conduct business with the familiar telephone keypad. The PBX Network is a digital voice, video and data communications system designed to meet the County's information movement and management requirements. The Mobile Data Radio Network 800 MHz digital communications system supports data communication needs, including those of the Montgomery County's Public Safety. The 800MHz Voice Radio Network is a network of radio receiving and transmitting stations at a variety of locations around the County. The radio system passes digitized voice and control signals for the operation of the 800 MHz trunked radio system. It is used by multiple County Departments and Agencies including Public Works and Transportation.

The standardization of technologies defined in the Enterprise Architecture encourages the development and purchase of reusable infrastructure and business components. It enhances in-house employee skill-sets in a predictable set of hardware, systems software, COTS packages, and communication and networking platforms. The tiered architecture permits horizontal scaling of solutions by rapid allocation of skills and resources. EA identifies a framework for County's IT initiatives with a great degree of specificity. It also offers a certain amount of flexibility permitting program managers a list of options for the development of their enterprise software solutions.

In its interaction with Solution Integrators and COTS Providers, the County also considers Project and Vendor Management as its core competency. DTS provides consulting services to the development and management of IT Projects. It provides leadership, technical assistance to departments in developing, managing and implementing IT Projects. It actively participates in vendor-negotiations and contract award activities, in addition to developing a rapport with solution providers.

Conclusions

The Department of Technology Services has identified core technologies as a foundation to rapid delivery of IT services. This document has been developed to serve as a reference and guide as new programs are identified or existing ones selected for upgrades and reengineering. This is a working document i.e. it will continue to evolve as technologies become available, provide an increasing return-on-investment and strategic leverage to solutions being developed.

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